



Insulin and Body Composition:

Insulin is a hormone that many of you have heard/read about in relation to diabetes and blood sugar regulation. Those who are in the body-building and/or weight lifting industry have heard about it because of some of insulin's anabolic (muscle building) properties. What does insulin do?

Well, in regards to blood sugar (glucose), insulin turns on the processes that allow sugar into cells. Why do we need sugar in cells? sugar (glucose, mainly) can be easily and quickly metabolized to provide energy (ATP). In fact, your body prefers sugar over fats and proteins to produce ATP because it is such a quick process.

If it were that simple, insulin would not have much of an effect on body composition (body fat, lean muscle mass, fat and muscle distribution). Like many processes in the body, especially in reference to hormonal processes, there are quite a few steps involved that make insulin's role more complicated than most people know.

Regarding body composition, there are some effects that most would consider wonderful:

1. Insulin Builds Muscle

Insulin stimulates protein synthesis in muscles by directing cells to make more protein. Muscle is made of protein which is manufactured in cells by organelles (little organs) called ribosomes. Insulin stimulates ribosomes to make more protein. Bottom line: Insulin is needed to build muscle.

2. Insulin Stops Muscle Break Down

3. Insulin Transports Building Blocks (Amino Acids) into Muscles

4. Insulin Increases Glucose Storage in Muscles

Insulin increases the activity of certain enzymes like glycogen synthase. These enzymes help to build storage of glucose within muscle so they can easily use it to produce energy so the muscles can perform work. This process also helps with muscle recovery.



The following is a list of activities stimulated by insulin that have negative effects on body composition:

- 1. Insulin Inhibits the Break Down of Body Fat (Fatty Acids Stored in Fat Cells) by Hormone-Sensitive Lipase**
- 2. Insulin Decreases the Utilization of Fat**

The main goal of insulin is to decrease sugar in the blood; to do this, we must do a few things; allow the blood sugar to be stored within cells and “burn” or metabolize any that’s leftover. One of the ways insulin can stimulate all this to occur is to “spare” fat; if our body is “blocked” from burning fat to produce energy, we are more likely to burn any remaining blood sugar.

- 3. Insulin Stimulates the Production of Fats in the Liver**

This is especially the case when you eat excess, processed carbs in your diet. A diet high in processed carbs will have an abundance of blood sugar, this will, in turn, require that insulin is secreted to deal with all of that sugar. The result (one of the many), is that your liver will be producing fats at an increased rate.

- 4. Insulin Activates Lipoprotein Lipase**

While it seems that this hormone will help you break down fat (and it does); the problem regarding body composition is that your liver is producing fats and converting the fatty acids into triglycerides; these triglycerides are not stored in fat cells (that’s a good thing). This is where lipoprotein lipase comes in; it will break down the triglycerides into fatty acids to be absorbed by fat cells, adding to your over all body fat.



Is Insulin Good or Bad?

Neither. Well, it's good; mostly! All hormones are needed to maintain homeostasis (that is, a state of internal balance). Insulin's main goal is to decrease blood sugar. Here's where it can become a little more complex; the standard modern diet is one of highly processed carbs (and therefore very readily available sugar). To deal with this constant influx of sugar, insulin is needed; in fact, insulin is secreted at levels higher than what's needed when we eat a whole-food, mostly plant-based diet.

By eating a balanced diet high in plant-based nutrients, you will maximize the good effects of insulin and blunt the bad effects. In addition, when ANY hormone is secreted at levels higher than optimal, a series of complex events occurs where all the cells receptive to that hormone start to "ignore it". With regards to insulin, this produces insulin resistance; the result is that our blood sugar remains high, we produce even more insulin to help deal with it and we keep filling our fat cells with fatty acids instead of burning the fat for energy. We now know that fat cells produce their own hormones like leptin, which "tells" the rest of the body how full the fat cells are with fatty acids. When leptin is secreted, the rest of the body knows that the fat cells are full and processes occur to burn fat..... this doesn't happen in the presence of high insulin levels and high blood sugar levels. This is the case with insulin resistance; it has been know for a long time that diets high in processed carbs can lead to this condition.

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